

ABSTRACT OF THE DISCLOSURE

Water electrolysis device determining stable isotopic composition of water and a water electrolysis method for stable isotopic composition of water capable of analyzing many samples easily, safely and at low cost in very short time, and rapidly analyzing ^{17}O are provided. The water electrolysis device performing mass spectrometry of hydrogen or oxygen stable isotopic composition includes a proton exchange membrane of fluorocarbon polymer plated non-electrolytically with platinum, iridium, rhodium or iridium-rhodium alloy, and a cathode and an anode of porous titanium plated with platinum and sandwiching the proton exchange membrane, wherein water electrolyzes by introduction into the anode side chamber and supplying DC current between the anode and the cathode, and oxygen gas generated at the anode and hydrogen gas generated at the cathode respectively flows into an isotope ratio mass spectrometer. Water electrolysis method for stable isotopic composition of water using the water electrolysis device is also provided.